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(56) Documents Cited  
GB 2116921 A WO 96/22203 A1 US 5561882 A

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(54) Abstract Title  
Fluid reservoir and air duct

(57) A fluid reservoir - air duct arrangement comprises a fluid reservoir module 1 with one or more air duct elements 3, 5 connected thereto. The reservoir may contain screenwash fluid for washing windscreens or headlights of a vehicle. The arrangement may be mounted behind the vehicle instrument panel.

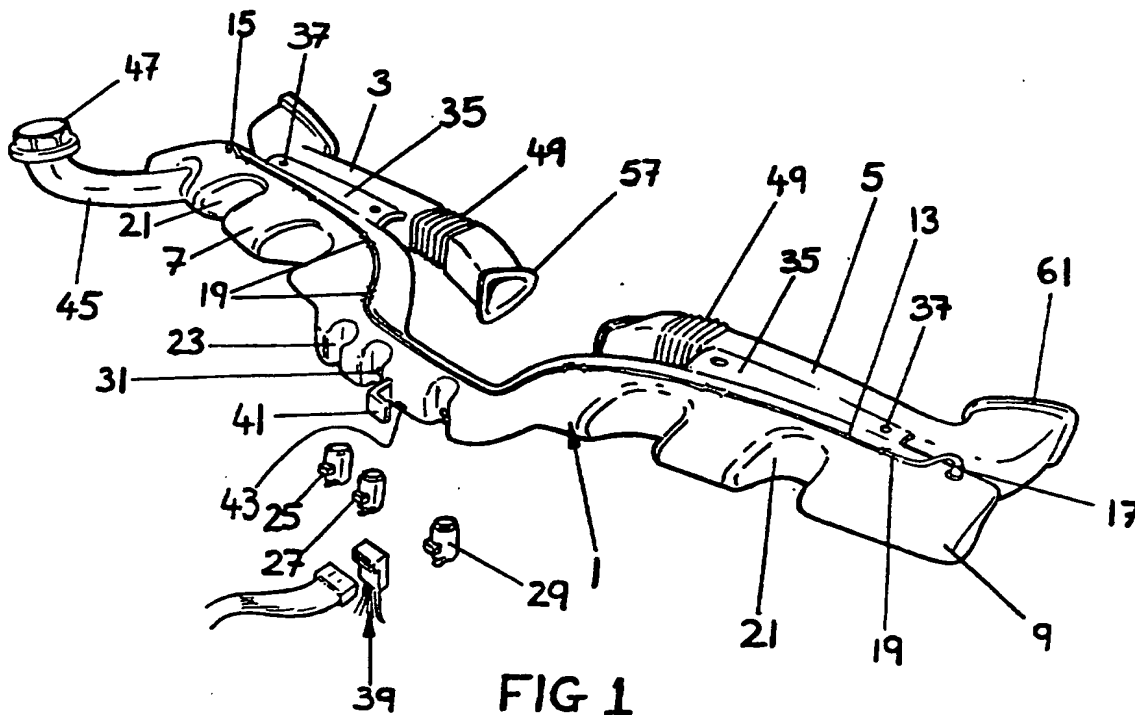


FIG 1

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At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.



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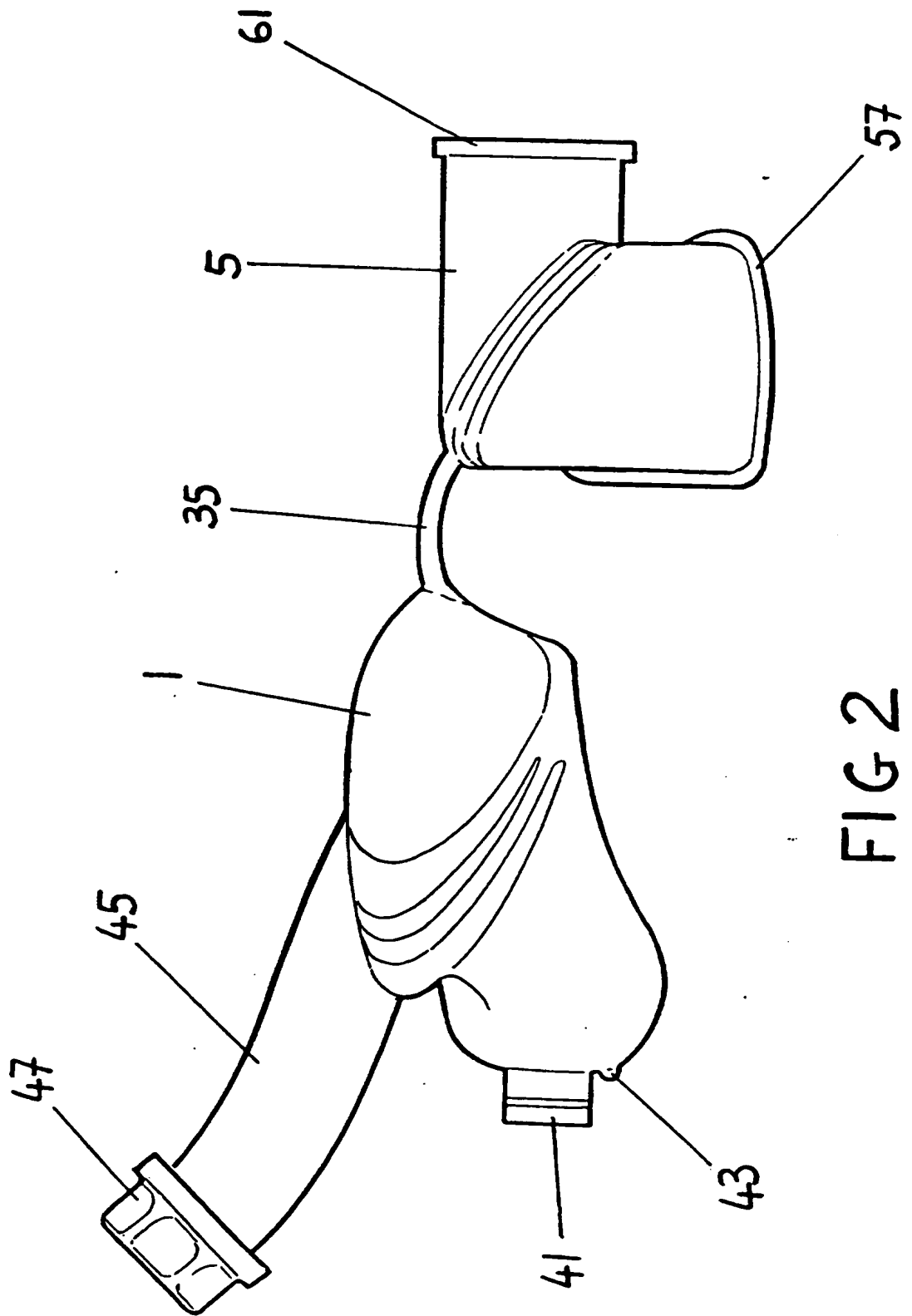


FIG 2

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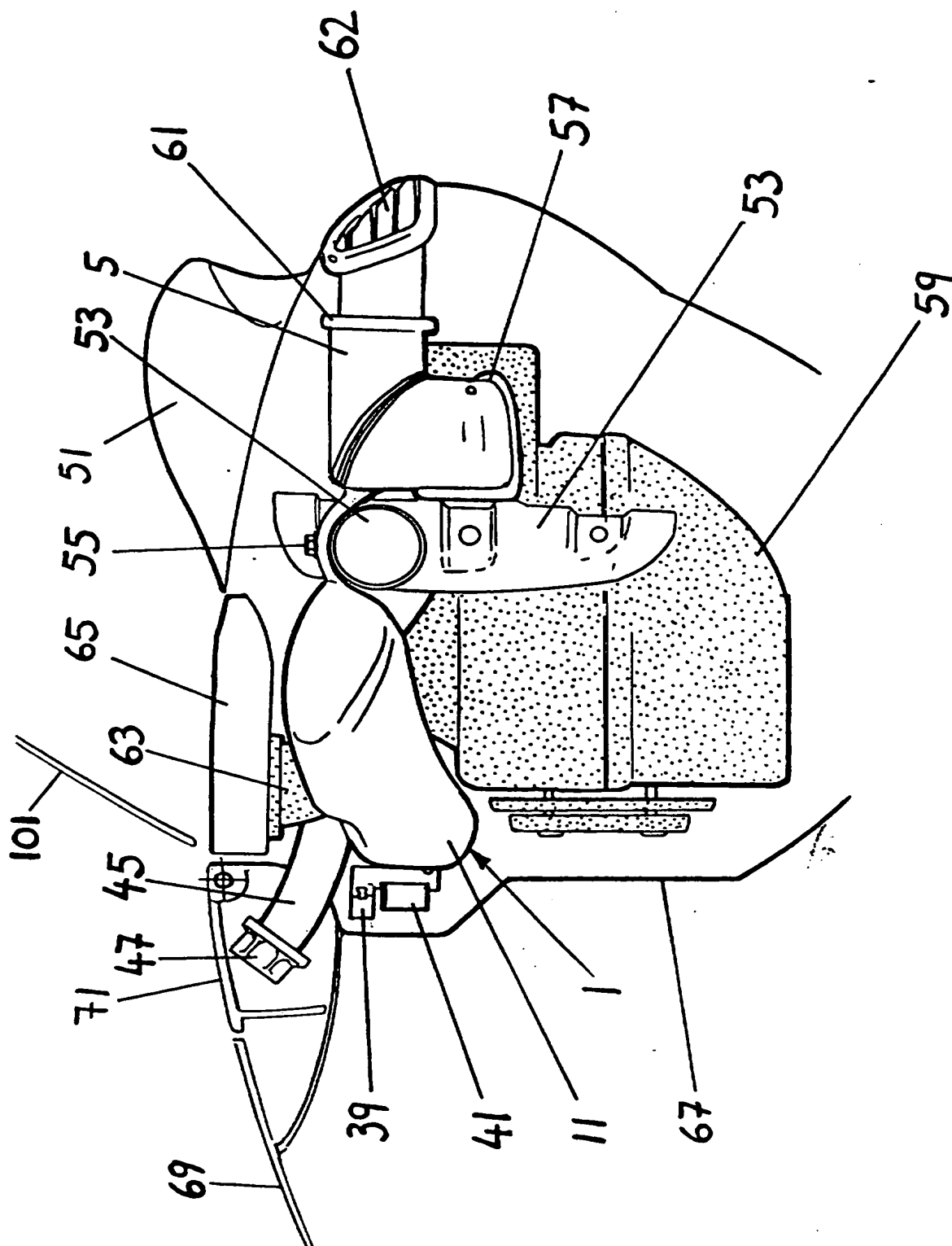
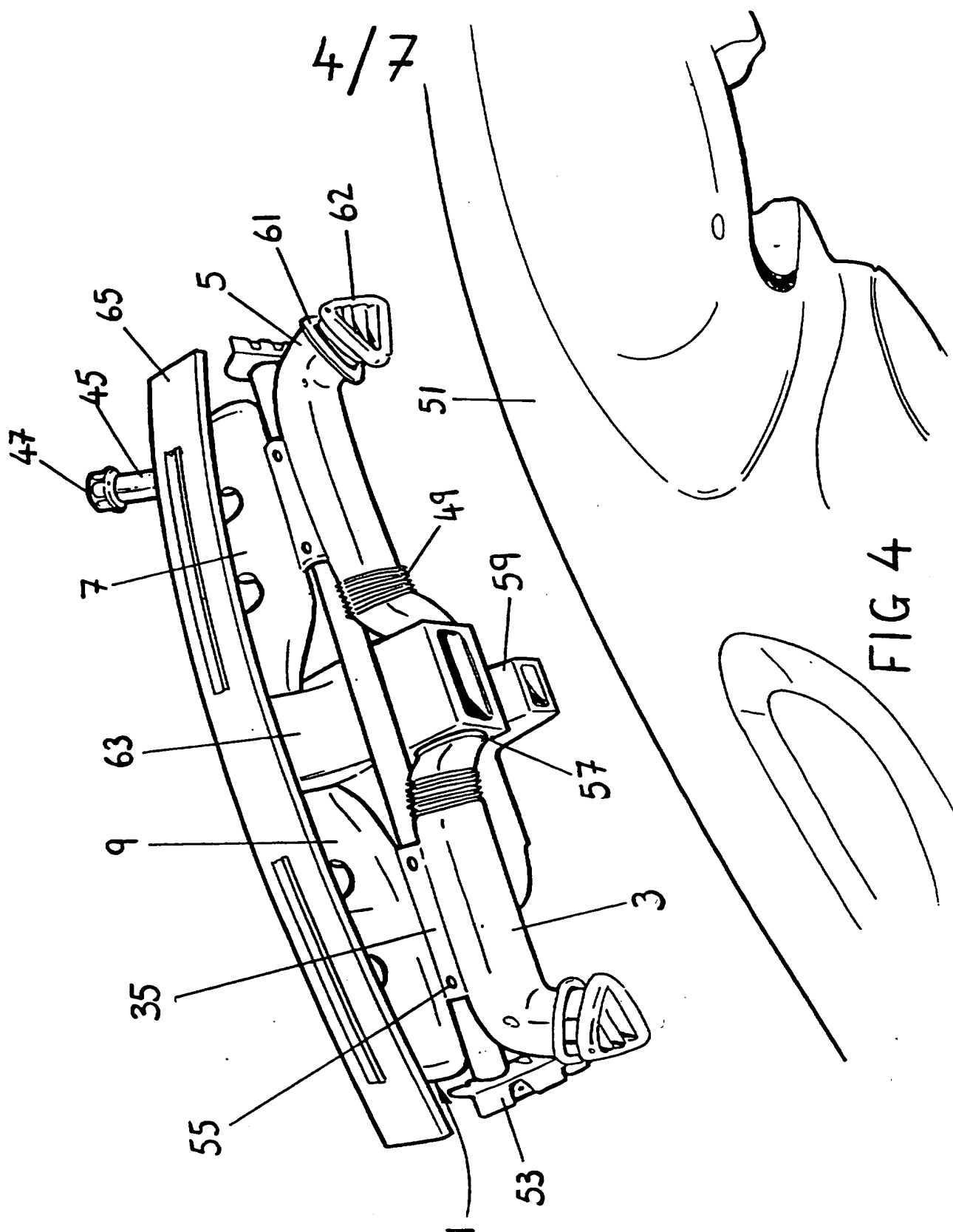


FIG 3



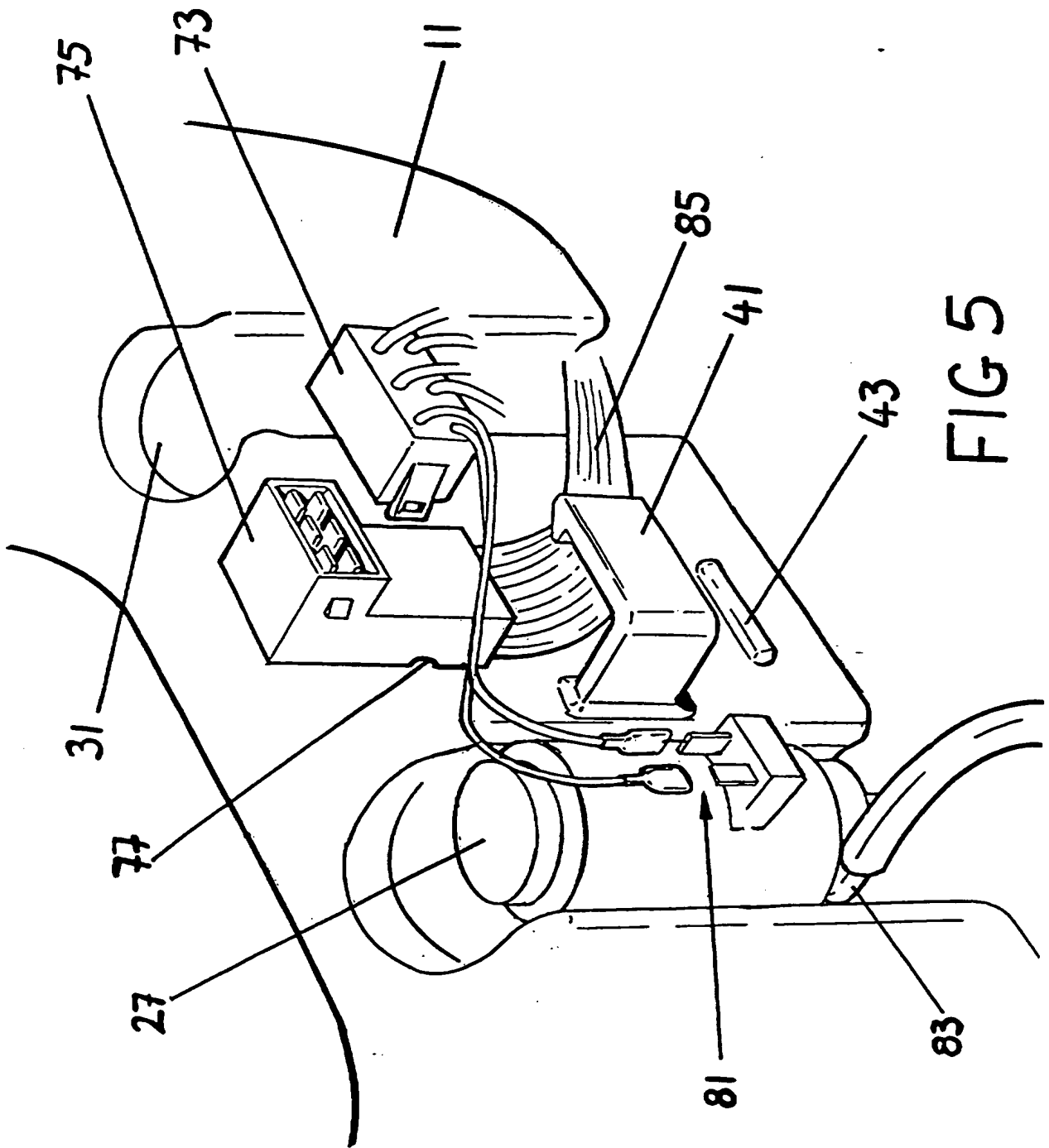


FIG 5

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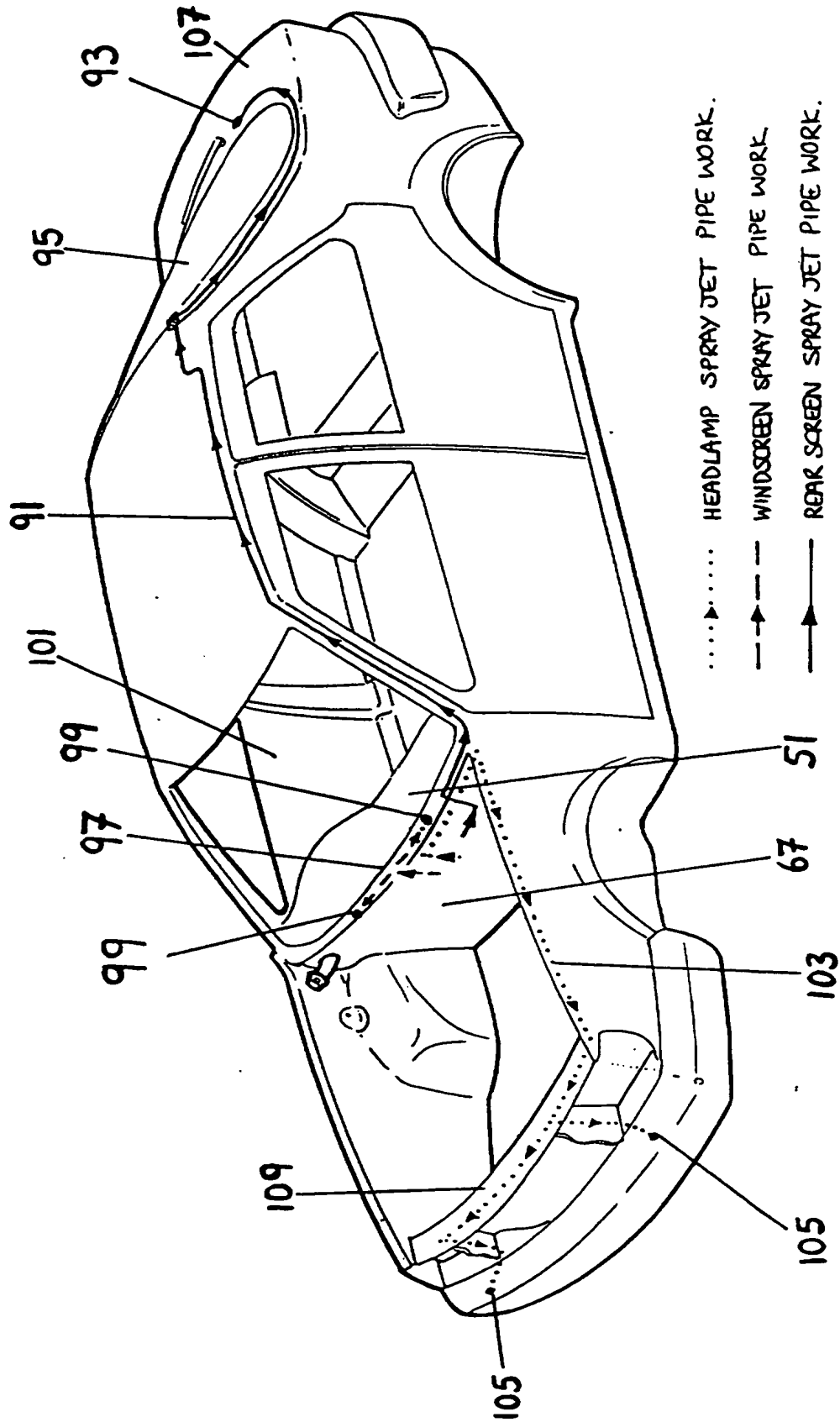


FIG 6

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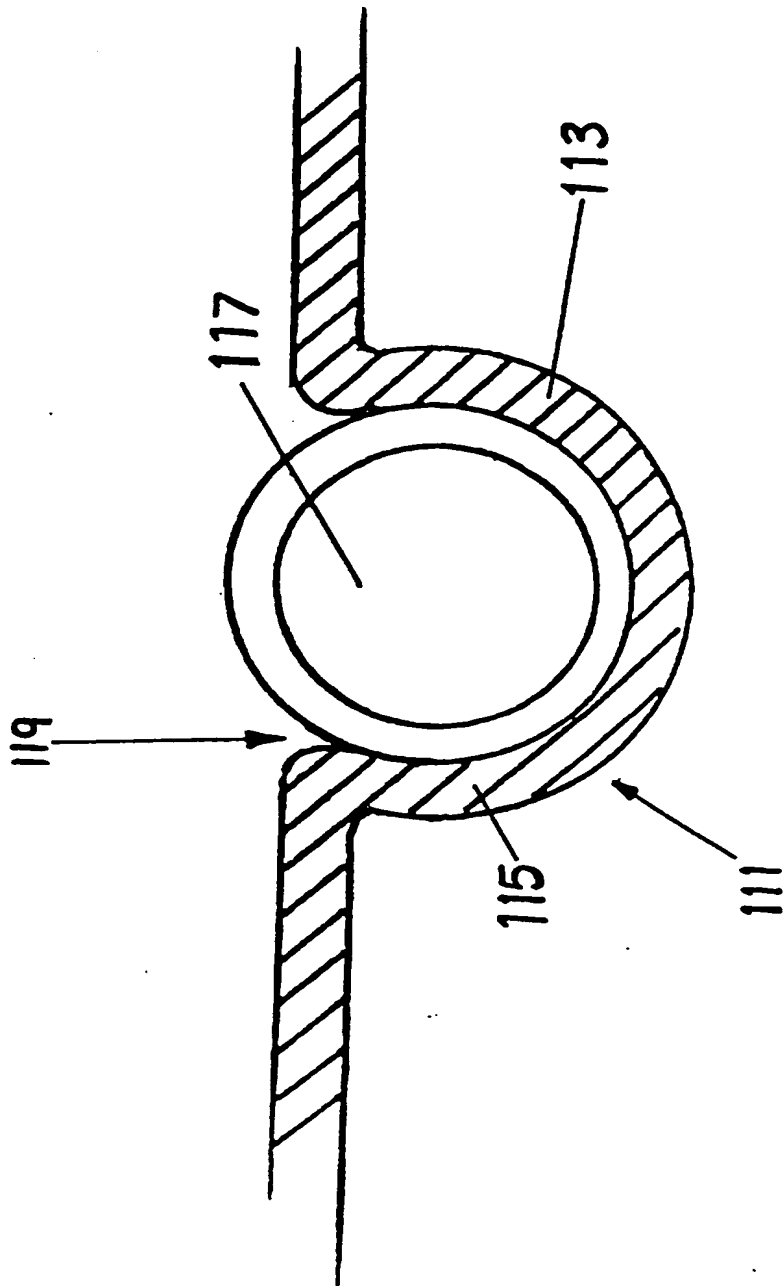


FIG 7



FLUID RESERVOIR - AIR DUCT ARRANGEMENT.

This invention relates to a fluid reservoir - air duct arrangement..

Screen wash and other refillable reservoirs have been traditionally located in the engine compartment of most automotive vehicles, particularly cars and small to medium sized vans. With modern car and like construction, the space in the engine compartment has become more and more limited because of increasing demands to be made of it in the way of additional components such as turbochargers and air conditioning systems. Also, it is necessary, due to the restricted room available to make each reservoir a custom shape for each vehicle. Therefore it is eminently desirable to move whatever components can be located satisfactorily elsewhere

One such item is the various fluid reservoirs, particularly those used for holding wash liquid for washing windscreens or headlights.

Another problem with fluid reservoirs is the necessity and often inconvenience in filling them. Mostly the filling arrangements have been located in the engine compartment of the vehicle. However, this is a dirty area of the vehicle and it is almost impossible to fill the fluid reservoirs to avoid getting some dirt on ones hands or clothes. Thus, again, movement of the fluid reservoirs away from engine compartments would be an advantage.

The present invention therefore seeks to provide a fluid reservoir which can be situated elsewhere in the vehicle, and, in the present case, situated in a position in combination with the air duct arrangements of a vehicle.

According to the invention, there is provided a fluid reservoir - air duct arrangement comprising a fluid reservoir module having one or more air duct elements connected thereto.

On or more air duct elements may be provided for location behind the dashboard of a vehicle to provide connection between the vehicle heating and ventilating unit and air exhaust ports into the vehicle. The air duct(s) may be formed in a single piece with the fluid reservoir module or the air duct(s) may be formed as separate elements connected to the fluid reservoir module by.

The fluid reservoir module may comprise two main volumes separated by a narrower volume and the two main volumes of the fluid reservoir module may be also connected together by a bleeder pipe located at the upper parts of the two volumes to prevent the formation of air locks between the two main volumes.

One or more of the volumes may have baffles therein to prevent rapid movement of the fluid contained therein.

The invention will now be described in greater detail, by way of example, with reference to the drawings, in which:-

Figure 1 is an exploded perspective view of a fluid reservoir - air duct arrangement with ancillary equipment, in accordance with the invention.

Figure 2 is a side view of the fluid reservoir - air duct arrangement of figure 1.

Figure 3 is a side view of the fluid reservoir - air duct arrangement of figures 1 and 2 assembled with an instrument panel;

Figure 4 is a perspective view the fluid reservoir - air duct arrangement and associated parts;

Figure 5 is a perspective view of a detail of the fluid reservoir - air duct arrangement showing the electrical component layout;

Figure 6 is a perspective view of a car body showing the layout of the pipework from the fluid pumps of the fluid reservoir - air duct arrangement to the respective jet locations, and

Figure 7 is a diagrammatic view of an overcentre snap arrangement suitable for retaining components on the fluid reservoir module.

In the embodiment shown, the invention is applied to a fluid reservoir for containing screen wash liquid for washing the front and rear windscreens and optionally the head lights of a car in combination with air ducts forming a fluid reservoir - air duct arrangement for mounting behind the instrument panel of a vehicle, the air ducts providing connections between the heating, ventilating and/or air conditioning unit of the vehicle and air outlets to the interior of the vehicle.

Referring firstly to figures 1 and 2, the fluid reservoir module 1, often called a "wash bottle", can be seen, together with air ducts 3 and 5 together with ancillary equipment shown in an exploded view.

The fluid reservoir module 1 comprises two main container portions 7 and 9 connected by a narrower portion 11, there being free flow between all three portions. So as to ensure that the narrower portion 11 does not act to provide an airlock in the fluid reservoir module, a bleed pipe 13 is provided being connected to the main container portion 7 at 15 and to the main container portion 9 at 17. The bleed pipe 13 runs along the top of the fluid reservoir module 1 and is retained by molded clips 19. Baffles, formed by indentations 21, are located in the main container portions 7 and 9 to reduce end to end movement of the fluid in the fluid reservoir module 1 when forces act on the vehicle in which it is mounted, such as when cornering. Indentations 23 in the narrower container portion 11 have the same effect but are additionally used to house fluid pumps 25, 27 and 29 which may be secured therein by any suitable method such as the snap fitting arrangement shown in figure 7.

To this end, the narrower container portion 11 of the fluid reservoir module 1 has apertures 31 which are aligned, with the interspersed sealing grommets, with inlet apertures (not shown) on the pumps 25, 27 and 29.

In the present example, pump 25 feeds jets for washing the front windscreen of the vehicle, pump 27 feeds jets for washing the rear screen and pump 29 feeds jets for washing the headlamps as will be described hereafter in connection with figure 6. The pumps 25, 27 and 29 are located at the lowest positions on the fluid reservoir module 1 so as to ensure that maximum fluid capacity can be used.

Provision is also made for the retention of a composite electrical connector 39. This provision comprises a spring arm 41 and a locating boss 43 molded on to the exterior of the narrower volume 11 of the fluid reservoir module 1.

Filling of the fluid reservoir module 1 is carried out through a filler spout 45 which is closed by a cap 47.

The two air ducts 3 and 5 are fixed to the structure of the fluid reservoir module 1. They are attached to the fluid reservoir module 1 by bridging flanges 35. The air ducts 3 and 5 may be separate items attached to a flange molded onto the fluid reservoir module 1 by welding, gluing or the use of mechanical retention or may be molded in with the fluid reservoir module. The flanges 35 may be provided with apertures 37 whereby the fluid reservoir - air duct arrangement can be attached to the main structure of the instrument panel of a vehicle or to other parts of the vehicle body.

The air ducts 3 and 5 are intended to provide a connection between the heating, ventilating and/or air conditioning unit of the vehicle and the outer ventilators 62. To make the connection easier, the ducts are provided with concertina portions 49 to increase their flexibility.

Figures 3 and 4 show the arrangement of the fluid reservoir - air duct arrangement in relation to the instrument panel of the vehicle. As can be seen, the fluid reservoir - air duct arrangement sits behind and below the instrument panel molding 51 with the flanges 35 sitting on the cross vehicle beam 53, secured thereto by nuts and bolts 55. Flanges 57 connect the air ducts 3 and 5 to the outlets of the heating, ventilating and/or air conditioning unit 59 while flanges 61 connect the ducts 3 and 5 to outer ventilators 62.

As can be seen, the narrower volume 11 of the fluid reservoir module 1 is shaped so as to pass around the heating/ventilating duct 63 leading to the demist ventilator 65. The filler spout 45 protrudes through the vehicle bulkhead 67 and ends below the cowl top 69 and has its own filler flap 71.

Figure 5 shows a detail of the narrow volume 11 of the fluid reservoir module 1 showing the arrangement of the electrical components and pump assemblies. The power supplied to the fluid pumps 25, 27 and 29 is channeled through a two part composite connector 39 which allows a single operation to connect the power of the vehicle to the pumps. The female half 73 of the composite connector 39 is connected to the respective pumps 25, 27 and 29 prior to the assembly of the fluid reservoir module 1 into the vehicle.

The male part 75 of the composite connector 39 is fixed to the fluid reservoir module 1 by the resilient arm 41 as previously stated, the connector 39 being further retained by means of the locating boss 43 which mates with a corresponding recess 77 in the main body of the male connecting part 75. The male connecting part 75 is connected to the vehicle wiring harness indicated at 85.

In figure 5, only the pump 27 is shown, its electrical connections to the power supply from the composite connector 39 being shown at 81 and its pipework connection being shown at 83.

Figure 6 shows an example of the paths which may be followed by the pipework supplying washing fluid to the washer nozzles. As shown, three separate paths are provide. One, shown in full lines at 91, feeds the nozzle 93 for the rear windscreen 95. A second, shown in broken lines at 97, feeds the two nozzles 99 for the front windscreen 101 while a third, shown in dotted lines at 103, feeds the two nozzles 105 for the head lamps. Each of these paths is fed by a single one of the pumps 25, 27 and 29 as detailed earlier.

Thus, the pipework 91 for the rear screen 95 runs from its pump under the instrument panel 51 up the adjacent pillar to the vehicle head lining, running beneath the head lining to the rear door 107 and so to the spray jet 93.

The front windscreen pipework 97 is fed from its pump under the instrument panel 52 and up the spray jets 99.

The pipework 103 for the headlights is fed from its pump along under the instrument panel 51, along the front nearside wing. It continues along the exterior of the engine compartment to the front upper cross vehicle beam 109 to the headlamp spray nozzles 105.

Figure 7 shows a suitable form of overcentre snap connector 111 which can be used both for mounting the pumps 25, 27 and 29, and, in a different size, for retaining the pipework 19, 91, 97 and 103. Thus the connector 111 is in the form of a resiliently formed fixing 113 having a loop 115 to surround the member 117 being held thereby. As can be seen, the loop 115 has an opening 119 which is somewhat smaller than the member 117 so that it can be snapped onto the member 117, thus retaining it in the loop 115. the fixing 113 itself is fastened, suitably by its ends, to the structure to which the member 117 is to be secured or may be an integral part of the structure.

It will be appreciated that the above describes only one embodiment of a fluid reservoir - air duct arrangement and many other possibilities exist within the scope of the appended claims. For example, the routing of the various pipework will depend on the particular construction of the vehicle on which the invention is used. In some cases, only two of the pumps will be needed where, for example, no headlamp washers are provided. On a saloon car, which does not have a rear wash wipe system only one pump may be required. There again, if desired more than three pumps may be used.

In a further alternative one pump may carry out more than one function. Thus the function of front windscreen washer and headlamp washer may be combined.

It will also be understood that while the fluid reservoir described has been for the windscreen and headlight washing fluid, the fluid reservoir could be used as a reservoir for any other liquids which may be required to be topped up. It is even feasible to imagine that in some circumstances, more than one fluid reservoir could be provided, each containing a fluid for different purposes. Thus, the fluid reservoir module could be divided into a number of sealed compartments, each with its own filling arrangements and, where required, its own pump(s). Furthermore, the filling arrangements may be located in any suitable position, such as within the body of the vehicle adjacent to the instrument panel or in one of the front wings.

The above described embodiments allow for a fluid reservoir - air duct arrangement to be supplied to a motor manufacturer in a pre-assembled form, thus reducing the number of operations needed to be carried out by the motor manufacturer.

**CLAIMS:**

1. A fluid reservoir - air duct arrangement comprising a fluid reservoir module with one or more air duct elements connected thereto.
2. An arrangement as claimed in claim 1, wherein one or more air duct elements are provided for location behind the dashboard of a vehicle to provide connection between the vehicle heating and ventilating unit and air exhaust ports into the vehicle.
3. An arrangement as claimed in claim 2, wherein the air duct(s) is(are) formed in a single piece with the fluid reservoir module.
4. An arrangement as claimed in claim 2, wherein the air duct(s) is(are) formed as separate elements connected to the fluid reservoir module.
5. An arrangement as claimed in any preceding claim, wherein the reservoir module comprises two main volumes separated by a narrower volume.
6. An arrangement as claimed in claim 5, wherein the two main volumes of the reservoir module are also connected together by a bleeder pipe located at the upper parts of the two volumes to prevent the formation of air locks between the two main volumes.
7. An arrangement as claimed in claim 5 or 6, wherein the volumes have baffles therein to prevent rapid movement of the fluid contained therein.
9. An arrangement as claimed in any preceding claim, wherein the reservoir module contains one or more recesses for mounting fluid distribution pumps.
9. An arrangement as claimed in claim 9, wherein the reservoir module contains outlets aligned with the pump inlets.



10. A fluid reservoir - air duct arrangement substantially as described herein with reference to the drawings.



Application No: GB 9724919.7  
Claims searched: 1-10

Examiner: Vaughan Phillips  
Date of search: 15 June 1998

**Patents Act 1977**  
**Search Report under Section 17**

**Databases searched:**

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:  
UK Cl (Ed.P): B7H (HLD, HLG, HLK, HLX)  
Int Cl (Ed.6): B60S  
Other: Online: WPI

**Documents considered to be relevant:**

Category	Identity of document and relevant passage	Relevant to claims
X	GB 2116921 A (FORD) see whole document	1 at least
X	WO 96/22203 A1 (ITT) see Fig. 2, duct 17	1 at least
X	US 5561882 (VALEO) see col. 3 lines 31-54	1 at least

X Document indicating lack of novelty or inventive step  
Y Document indicating lack of inventive step if combined with one or more other documents of same category.  
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A Document indicating technological background and/or state of the art.  
P Document published on or after the declared priority date but before the filing date of this invention.  
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